ABSTRACT

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Title of the Dissertation Thesis:
Application of HPLC technique in analysis of food supplements based on plant extracts

The disseration thesis deals with complex issues of food supplements based on plant extracts in terms of the content of bioactive substances, purity assessment, and legislative efficacy and safety requirements.

The quality of food supplements available on the market in the Czech Republic was tested in six studies. Two HPLC and four UHPLC methods have been developed and validated to determine the content of bioactive substances in food supplements containing plant extracts and other excipients. In each work, such analytical conditions were found allowing a rapid and accurate determination of the content of the given bioactive substances in food supplements, particulary in the problematic separations of some isomeric substances. Additionally, sample preparation methods for each group of food supplement samples have been developed and optimized to avoid the matrix interferences during the separation and detection of analyzed bioactive substances.

A conventional approach to the analytical determination of the bioactive substances in plant extracts using HPLC instrumentation is to employ the C18 stationary phase in combination with the long analysis times that are necessary to achieve a desired separation of analyzed substances in the extracts. Several alternative stationary phases were tested in the presented studies. Complex retention studies of the analysed compounds were performed on the selected columns to obtain the best selectivity for the analytes.

It has been shown that the quality of the analyzed food supplements containing plant extracts varies greatly. In some cases, no quantity of the declared substance has been found, which is a very alarming finding for consumers.